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|  | **Physics** | **شعار-القسم** |
| **Refraction of lights** |
| Worksheet-8- |

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| --- | --- |
| Name: Class: 8 /……........ | |
| Book pages: | |
|  | Date: -5-2012 |
| 8.18.3 - 8.18.5- 8.18.6 | Core Standard number |
|  | Learning Objectives  Logo + text 2 |

**A**-Refraction of light

**1-a-Set up the following apparatus and complete the figure and label it:**

Glass

Air

**2- Use the previous apparatus to do the following**

1. Set the apparatus in a way the incident ray travels from air to any transparent substance:

1-complete the following table: (transparent substance is glass)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Incident ray(o) | 0 | 10 | 15 | 20 | 30 | 45 |
| Refracted ray(o) | 0 | 7 | 10 | 15 | 20 | 30 |

2--Compare the angle of incidence to the angle of refraction

angle of incidence is larger than angle of refraction

3--Are all the incident rays refracted?

yes.

1. Set the apparatus in a way the incident ray travels from any transparent substance to air:
2. Complete the following table: ( transparent substance is glass)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Incident ray(o) | 0 | 7 | 10 | 15 | 20 | 30 |
| Refracted ray(o) | 0 | 10 | 15 | 20 | 30 | 45 |

1. Compare the angle of incidence to the angle of refraction

angle of refraction is larger than the angle of incidence.

1. Are all the incident rays refracted? If not in which condition?

No. The angle of incidence must be smaller than 43o to have refraction.

1. a- Do the same as above with different transparent substances. What do you notice?

For each substance refraction is possible if the incident ray is smaller than a certain angle called critical angle,

b- Define the critical angle

It is the angle of incidence that provides an angle of refraction of 90-degrees

c- What is total internal reflection?

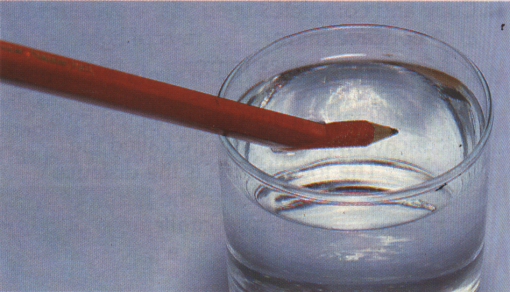
When the angle of incidence greater than the critical angle the all ray of light is reflected inside

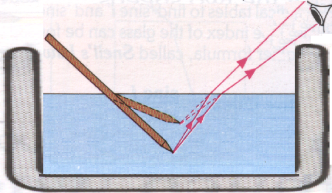
the glass.

4- Everyday application of refraction.

1. Real and apparent depth

Look at the picture below and answer the following questions:



 a-Is the pencil appear to be broken or it really broken?

It appears broken..

b- How do you explain that?

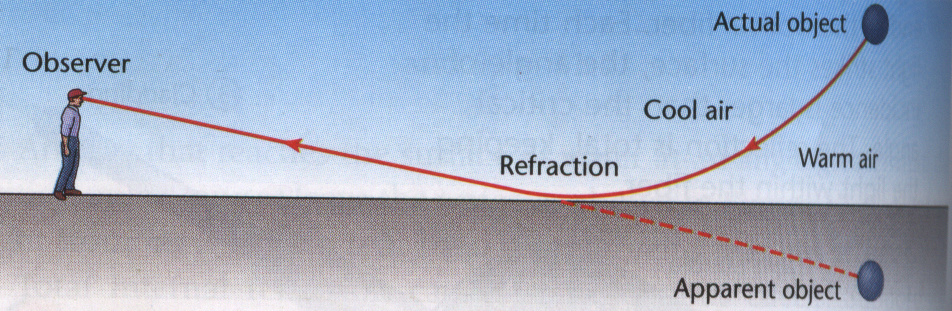
The rays of light from the part of pencil under the water are refracted away from the normal .

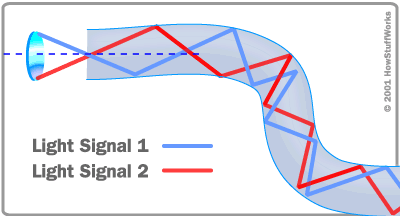
1. Mirage

Sometimes, on a hot day, you might see what look like pools of water on a long stretch of road. This happens because there are hot layers of air near the hot road and cooler (denser) layers of air higher up.

When light meets a hot layer near the ground at an angle greater than the critical angle and total internal reflection takes place.

Complete the following image



3- Fiber optics

The picture above shows how a fiber optic works